

HAWKEYE



The Optical SMART Board Project

Optical SMART Board

Project Team

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Product Description

Hawkeye is the code name for a new product family from SMART Technologies Inc. The first Hawkeye product from SMART is anticipated to launch in . The basic concept behind Hawkeye is the intelligent capture of whiteboard and greenboard / blackboard information digitally using optical sensors and personal or embedded computers.

The product would involve:

- a camera, mounting hardware and software product that can capture board images using digital camera technology (either manufactured by SMART or commercially produced)
- technology licensed from that enables the creation of editable bitmap images, the correction of keystone images, color normalization and mosaicing (image stitching)
- software created by SMART that would add a user-friendly interface and enable images to be printed, stored and retrieved simply and easily

Three different concepts of the product have been suggested:

Hawkeye Concept 1

- utilizes a single or multiple fixed camera(s) to capture and store multiple images. The mosaicing software could be used to stitch these images together if appropriate. These images can be shared either as hardcopy or softcopy through a network or stored on a PC. The system would include a camera, mounting hardware, operating and image-capturing software, and an embedded PC (or PDA) with a LCD display that could be connected to a PC, network and/or a printer.

Hawkeye Concept 2

- utilizes a single (or multiple) fixed image camera capable of capturing board images and storing them as softcopies on a PC. This system would not require an embedded PC or PDA device as it would be designed to be connected to a dedicated PC.

Hawkeye Concept 3

- utilizes a fixed-image camera capable of capturing one board image and producing a hardcopy of that image. This system would be a stand-alone unit that would include a camera, mounting hardware, operating and image capturing software, an embedded PC and a printer.

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User Scenarios

There are three perceived user scenarios for this technology. Generally, these arise from situations in which PC's and/or network connections are available and in which information must be gathered, stored and retrieved.

- **Meeting Room use**
 - ⇒ rooms are used by a wide variety of personnel who require a simple way to capture, store and distribute their meeting notes
 - ⇒ rooms may have large boards or multiple boards on which information should be captured
 - ⇒ information could be easily captured, stored, retrieved and manipulated
 - ⇒ rooms will have a dedicated meeting room PC or, minimally, network connections
 - ⇒ product must be an effective information management solution that requires little or no training
- **Classroom use**
 - ⇒ instructors could make use of a simple, convenient solution to capture notes made during a class or lecture
 - ⇒ rooms may have large boards or multiple boards on which information should be captured
 - ⇒ product could capture and then distribute the notes and information on paper or electronically
 - ⇒ information could be easily captured, stored, retrieved and manipulated
 - ⇒ teachers need a system that could work with their current board set-up (black/green boards or whiteboards) using regular ink, whiteboard markers or even chalk
 - ⇒ rooms will have a dedicated meeting room PC or, minimally, network connections
 - ⇒ product must be an effective information management solution that requires little or no training
- **Individual / cubicle use**
 - ⇒ individuals who need to capture notes in smaller meetings or brainstorming sessions in their cubicles or at their desks
 - ⇒ cubicles or offices have insufficient room for a large board
 - ⇒ information could be easily capture, stored, retrieved and manipulated
 - ⇒ space will have a personal PC

Hawkeye Concept 2 would provide a simple and inexpensive solution for individual/cubicle use. It could capture notes in a defined area and allow the retrieval and editing of these notes at a later date. A fixed-lens camera could be produced (or purchased) very economically and would not require a great deal of space to use. The Hawkeye system could be directly connected to the individual's PC.

Multiple cameras could be used in larger meeting rooms or classrooms. This would enable the user to capture information from a larger area by taking multiple images and, if desired, stitching them together into a single image by utilizing the mosaicing software. Ideally, this imaging system could be used with a variety of boards as the imaging technology could capture images created using regular ink, whiteboard markers, chalk or other writing tools. *Hawkeye Concept 1* would be focused on fulfilling these needs.

There is also a high demand for copyboard products that can quickly produce a hardcopy of an image. A simple, stand-alone product that includes a small processing device (or embedded PC) and printer can be made that will have higher image quality than standard copyboards because of the camera image (*Hawkeye Concept 3*). The product would not require a dedicated PC and could, ideally, be connected to a variety of printers. Concept 1 and 2 could be connected to a printer and may be more economical options than the SMART Copyboard product. For the remainder of this Product Proposal, only Concepts 1 and 2 will be considered.

Product Development Requirements

There are five major pieces in the development of this product:

1. **Image Capture software** - this has been successfully developed by _____ of _____ has been approached about licensing this technology to SMART and appears to be interested in doing so. Discussions are underway to work out the details of an agreement.
 - How well does this software capture images?
 - Can images be captured on various surfaces?
 - How well does the software adequately correct keystoneing?
 - Are the images easily edited and manipulated (strokification)?
 - Is use of the stitching utility necessary or is a single image capture adequate?
 - Are there additional patents in this area we should be aware of?
2. **User Interface software** - an easy-to-understand and easy-to-use interface must be developed to ensure that users are comfortable using this product. This software must also make it easy to store and retrieve the captured images. Meeting Pro may be utilized for image capture, storage and distribution.
 - Where will the images be stored when they are captured?
 - What format will the images be stored as?
 - How will the images be retrieved? Edited? Distributed?
 - What will the interface look like (goosey)?
3. **Camera Mounting hardware** - an unobtrusive method of mounting the cameras would have to be developed. This would require a mounting device designed for a fixed-lens camera (either used alone or in multiples) and unobtrusive connections to the processing device or PC, network and/or printer and power supply. The mounting hardware requirement also includes all devices with which the users will have to directly interact, such as an image capture button, a display screen, a remote control device, etc.
 - Where should the camera be mounted?
 - How will the wiring and cabling be managed (power and signal)?
 - How will the camera be mounted?
 - How will the camera be attached to the processing device? The power supply?
 - What sort of capture button should be used?
 - What kind of LED, LCD or feedback device would be most effective?
 - Is a remote control device possible? Necessary?
 - How are multiple cameras dealt with? Single vs. Multiple controllers
 - How will the device incorporate future changes or uses?
4. **Processing hardware** - the camera will produce an image that has to be processed before it can be viewed with satisfactory quality. There are a number of different options that need to be examined: full-size PC, embedded PC, a CE device or a PDA.
 - What processing device should be utilized?
 - Should any processing be done by the camera itself?
 - How will the processing device be connected to the camera?
 - What should be connected to the processing hardware (i.e. printer, network, monitors)?
5. **Camera hardware** - a decision regarding the use of off-the-shelf technology or a SMART-built a high-quality, low cost device to physically capture the images.
 - What kind of camera is required?
 - Should the device utilize a fixed-lens or pan-tilt-zoom camera?
 - Should SMART develop its own camera or use an off-the-shelf camera?
 - What will be the mounting restrictions?
 - Are there any strategic alliances that can be formed (e.g. _____ ?

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Positioning

Each Hawkeye product will be capable of capturing information written on a whiteboard surface and producing either a hardcopy or softcopy of that image. Some of the advantages of this product over those already on the market are:

- higher image quality
- ability to produce hard and/or soft copies of images
- editable soft images possible with the strokification software
- network connectability
- any type of whiteboard or blackboard could be used
- a variety of printers could be utilized
- uses 'real' paper instead of thermal or fax paper
- color or black & white printing would be possible

Distribution

Concept #1 of this product could be sold through SMART's current distribution channel of AV dealers and distributors. The products may be best represented through our existing dealer and distribution channels, allowing the dealers and distributors to assist with the installation and configuration of the systems. The price point would be high enough to allow our dealers the standard margin, therefore making it an attractive product to sell. Alternative methods of distribution, such as direct sales or retail sales, may be considered for the lower-priced products, however.

Competition

There are a number of competitors in the copyboard market. The major players appear to be:

- **Plus Corporation** - manufacturers of electronic copyboards. They have 2 or 4 writing panels (standard 36" x 51" or wide 36" x 71") and some models also have a projection screen. All versions come with built-in printers with the average print speed being 11 to 15 seconds. One model includes a PC interface and software to enable the user to download information written on the copyboard to a PC. Prices range from \$1300 to \$2500 US dollars.
- **Ricoh Elemex Corporation** - manufacturers of the Ricopy Board. The EB20/10 model features an 'endless' writing panel, multi-screen copying and two colour copying. It will also date and time stamp the copy. The US list price is \$1295.
- **Quartet** - looks like they OEM Plus Corporation products. One model they offer, however, seems to have more 'brains' than anything Plus offers. It can make multiple copies of a scanned image and can 'recall' the last image scanned. This added ability comes with a substantial price tag, however – the US list price is \$4475. Quartet does sell at least two of their product via retail catalogues. STAPLES has the 32" x 71" version for \$2699.99 CAN and the flip-chart size PC whiteboard (links up to a PC to save, file, print, and electronically distribute notes) for \$1319.00 CAN.
- **Panasonic** - offers five different types of "electronic white boards" in varying sizes. They come with 2 to 4 writing panels and a thermal printer. The boards can be connected to a plain paper printer and they claim to be PC-connectable. List prices range from approximately \$1400 to \$2400 US.
- **Numonics** - offers both projection and non-projection whiteboards. The non-projection board allows notes and drawings to be written in color and recorded in "real time" on a PC. They offer a "playback" feature to recall what took place during the meeting. The notes can be printed or distributed electronically. Their IWB (interactive white board) product has a list price of approximately \$2395 US.

Hawkeye Product Line would be directly competing with non-projection electronic whiteboards. Some of the known competitors are:

- DigitalBoard by Hitachi
- TeamBoard by Egan
- IdeaBoard by 3M
- SoftBoard by Microfield Graphics
- IPM by Numonics
- mimio by Virtual Ink
- Tegrity Meeting Solution by Tegrity

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